Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Period: \_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_

**Exploring Trends in the Periodic Table**

**Objective**: To discover the periodic trends of elements on the Periodic Table of elements.

**Background**: The Periodic Table is a useful tool that helps us predict properties of various elements. In this activity we will look at 3 properties:

Atomic radius: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Electronegativity: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Ionization energy: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Procedure**: Log on to [www.chemicool.com](http://www.chemicool.com). Click on the element symbols below.

1. Look up the Atomic Radius for the following elements and record the values in your blank periodic table (click on the element symbol and go down to Data Zone. Click on “show more’’ to see Atomic Radius).

* Lithium
* Beryllium
* Boron
* Sodium
* Magnesium
* Aluminum

1. What appears to be the trend in atomic radius as you move from left to right across a period?

Does it: increase? decrease? stay the same?

1. What appears to be the trend in atomic radius as you move down a group?

Does it: increase? decrease? stay the same?

1. **Predict the change** in atomic radius of the next elements in the period ([C](http://the-tech.mit.edu/chemicool/elements/carbon.html)arbon, [Si](http://the-tech.mit.edu/chemicool/elements/silicon.html)licon), then check those properties. Write them in your blank periodic table.

1. Predictions for **C = \_\_\_\_\_\_\_\_\_\_\_ Si = \_\_\_\_\_\_\_\_\_\_\_**

2. Look up the real answers and write them in your periodic table. **Does the trend match your predictions?**

1. Check the atomic radius of the next elements in the group ([N](http://the-tech.mit.edu/chemicool/elements/nitrogen.html)itrogen, [P](http://the-tech.mit.edu/chemicool/elements/phosphorus.html)hosphorus). Write the answers in your blank periodic table. **How do they fit the pattern you predicted?**
2. Is the pattern of atomic radius absolute or general (always true or generally true)?

**Repeat the same steps and questions, but look at the property of First Ionization Energy. DON’T FORGET UNITS!!!!!**

1. Look up the 1st Ionization Energy for the following elements and record the values in your blank periodic table (click on the element symbol and go down to Data Zone. Click on “show more’’ to see 1st Ionization Energy).

* Lithium
* Beryllium
* Boron
* Sodium
* Magnesium
* Aluminum

1. What appears to be the trend in first ionization energy as you move from left to right across a period?

Does it: increase? decrease? stay the same?

1. What appears to be the trend in first ionization energy as you move down a column?

Does it: increase? decrease? stay the same?

1. Predict the change in first ionization energy of the next elements in a period ([C](http://the-tech.mit.edu/chemicool/elements/carbon.html)arbon, [Si](http://the-tech.mit.edu/chemicool/elements/silicon.html)licon), then check those properties and write them in your blank periodic table.

1. Predictions for C = \_\_\_\_\_\_\_\_\_\_\_ Si = \_\_\_\_\_\_\_\_\_\_\_

2. Do the real values match your predictions?

1. Check the first ionization energy of the next elements in the series ([N](http://the-tech.mit.edu/chemicool/elements/nitrogen.html)itrogen, [P](http://the-tech.mit.edu/chemicool/elements/phosphorus.html)hosphorus) and write them in your blank periodic table. How do they fit the pattern you predicted?
2. Is the pattern of ionization energy absolute or general (always true or generally true)?

**Electronegativity**

1. Look up the Electronegativity for the following elements and record the values in your blank periodic table (click on the element symbol and go down to Data Zone. Click on “show more’’ to see Electronegativity).

* Lithium
* Beryllium
* Boron
* Sodium
* Magnesium
* Aluminum

1. What appears to be the trend in electronegativity as you move from left to right across a period?

Does it: increase? decrease? stay the same?

1. What appears to be the trend in electronegativity as you move down a group?

Does it: increase? decrease? stay the same?

1. Predict the change in electronegativity of the next elements in a period ([C](http://the-tech.mit.edu/chemicool/elements/carbon.html)arbon, [Si](http://the-tech.mit.edu/chemicool/elements/silicon.html)licon), then check those properties.

1. Predictions for C = \_\_\_\_\_\_\_\_\_\_\_ Si = \_\_\_\_\_\_\_\_\_\_\_

2. Do the real values match your predictions? Why or why not?

1. Check the electronegativity of the next elements in the series ([N](http://the-tech.mit.edu/chemicool/elements/nitrogen.html)itrogen, [P](http://the-tech.mit.edu/chemicool/elements/phosphorus.html)hosphorus) and write the values in the table above. How do they fit the pattern you predicted?

